

We claim:

1. A gas sensor for determining the concentration of a gas component of a measurement gas, comprising:

a layer structure including a reference electrode completely surrounded by a gastight material and;

a catalytically active working electrode which is to be exposed to the measurement gas.

2. The gas sensor of claim 1, wherein the gastight material is formed at least in sections by a solid electrolyte to which both the reference electrode and the working electrode are connected.

3. The gas sensor of claim 2, wherein the solid electrolyte is formed by an oxide ion-conducting material.

4. The gas sensor of claim 3, wherein the oxide ion-conducting material is yttrium-stabilized zirconium dioxide.

5. The gas sensor of claim 1, wherein the gastight material is formed in sections by a low-sodium glass cover layer.

6. The gas sensor of claim 1, wherein the gastight material is formed in sections by an electrically insulating carrier material.

7. The gas sensor of claim 1, further including a heating system.

8. The gas sensor of claim 1, wherein the reference electrode has at least one material component which is chosen from the following group: metals, metal oxides, and mixtures thereof.

9. The gas sensor of claim 1, wherein the working electrode has at least one material component which is chosen from the following group: precious metals, precious metal alloys, oxides, oxide mixtures and mixtures thereof.

10. The gas sensor of claim 1, wherein the gas sensor operates according to a potentiometric measurement principle.

11. The gas sensor of claim 9, wherein the gas sensor is capable of measuring λ values which are below 0.9.

12. The gas sensor of claim 11, wherein the gas sensor is capable of measuring λ values below 0.6.

13. The gas sensor of claim 12, wherein the gas sensor is capable of measuring λ values below 0.4.

14. A process for producing a gas sensor used for determining the concentration of a gas component of a measurement gas, comprising the steps of:

- providing a carrier layer of electrically insulating material;
- applying a solid electrolyte layer to the carrier layer;
- forming a reference electrode and a working electrode on the solid electrolyte layer; and
- covering the reference electrode with a gastight cover layer.

15. A process for producing a gas sensor used for determining the concentration of a gas component of a measurement gas, comprising the following steps:

- providing a carrier layer of electrically insulating material;
- forming a reference electrode on the carrier layer;
- covering the reference electrode with a gastight solid electrolyte layer; and
- forming a working electrode on the gastight solid electrolyte layer.

16. The process of claim 14, wherein electrically conductive connections are formed to the reference electrode and the working electrode.

17. The process of claim 14, wherein the solid electrolyte layer is formed by an oxide ion-conducting material.

18. The process as claimed in claim 14, wherein the cover layer is a low-sodium glass layer.

19. The process of claim 14, further comprising the step of forming an electrical heating system on a side of the carrier layer facing away from the reference electrode and the working electrode.

20. The process of claim 15, wherein the reference electrode has at least one material component chosen from the following group: metals, metal oxides, and mixtures thereof.

21. The process of claim 15, wherein the working electrode has at least one material component chosen from the following group: precious metals, precious metal alloys, oxides, oxide mixtures and mixtures thereof.

22. The process of claim 14, further comprising the step of choosing a catalytic activity of the working electrode such that the gas sensor is capable of measuring λ values which are below 0.9.

23. The process of claim 22, wherein the gas sensor is capable of measuring λ values below 0.6.

24. The process of claim 23, wherein the gas sensor is capable of measuring λ values below 0.4.